

Appl. No. 10/605,427
Amdt. dated July 4, 2005
Reply to Office action of April 04, 2005

Amendments to the Claims:

1. (currently amended) An amplifier with substantially fixed input impedance when operating in a plurality of gain modes, the amplifier comprising:
 - 5 an input port for receiving an input signal;
 - a gain circuit for amplifying the input signal by corresponding gain ratios in various gain modes;
 - a plurality of resistive negative feedback circuits electrically connected to the input port and the gain circuit for keeping the input impedance of the amplifier
 - 10 substantially fixed in the various gain modes, each of the various gain modes having at least one corresponding resistive negative feedback circuit; and
 - an output port for outputting the input signal amplified by the gain circuit.
2. (currently amended) The amplifier of claim 1 wherein in ~~a~~ each of the various
 - 15 gain ~~mode~~ modes, a feedback signal is fed back to the input port via at least a ~~corresponding~~ resistive negative feedback circuit corresponding to a current gain mode so as to keep the input impedance of the amplifier substantially fixed in the various gain modes.
- 20 3. (currently amended) The amplifier of claim 2 further comprising ~~at least a switch device~~ a plurality of switch devices respectively electrically connected in series with to
~~at least the plurality of a predetermined~~ resistive negative feedback ~~circuit circuits~~
for ~~determining~~ controlling whether a respective the feedback signal is fed back to the
input port via each of the plurality of the predetermined resistive negative feedback
25 ~~circuit circuits~~ according to a current various gain modes mode.
4. (original) The amplifier of claim 1 wherein the gain circuit comprises a plurality of bipolar junction transistors or a plurality of MOS transistors.

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5. (currently amended) The amplifier of claim 1 wherein the plurality of resistive negative feedback circuits are respectively a resistor being electrically connected in series with ~~to~~ a capacitor.

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6. (original) The amplifier of claim 1 being a low-noise amplifier.

7. (original) The amplifier of claim 6 being applied to a receiver of a wireless communication system.

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8. (currently amended) A method used in an amplifier for keeping the input impedance of the amplifier substantially fixed in a plurality of gain modes, ~~the amplifier comprising a gain circuit and a plurality of resistive negative feedback circuits, the method comprising:~~

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providing a gain circuit for amplifying an input signal by corresponding gain ratios according to the gain modes;

providing at least one resistive negative feedback circuit for each of the various gain modes, each resistive negative feedback circuit being electrically connected to the gain circuit and the input signal;

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utilizing the gain circuit to switch the amplifier among the various gain modes; and
utilizing the plurality of resistive negative feedback circuits to keep the input impedance of the amplifier substantially fixed in various gain modes.

9. (currently amended) The method of claim 8 wherein the amplifier further comprises an input port and an output port, the method further comprising:

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utilizing the input port to receive ~~an~~ the input signal;

~~utilizing the gain circuit to amplify the input signal by corresponding gain ratios in various gain modes;~~

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in each of the various gain modes, making a feedback signal be fed back to the input port via at least a ~~corresponding~~ resistive negative feedback circuit corresponding to a current gain mode ~~in various gain modes~~ so that the input impedance of the amplifier remains substantially fixed in the various gain modes, wherein the
5 feedback signal is related to the input signal; and
utilizing the output port to output the input signal amplified by the gain circuit.

10. (currently amended) The method of claim 9 wherein the amplifier further comprises a switch device electrically connected in series with ~~to~~ a predetermined
10 resistive negative feedback circuit, the method further comprising:
turning on or turning off the switch device according to the various gain modes to ~~determine-control~~ whether the feedback signal passes through the predetermined resistive negative feedback circuit to the input port.

15 11. (currently amended) The method of claim 9 wherein the amplifier further comprises a plurality of switch devices; each switch device being respectively electrically connected ~~to~~ in series with the plurality of resistive negative feedback circuits; ~~each switch device corresponding to a resistive negative feedback circuit~~, the method further comprising:
20 turning on at least a switch device in each gain mode so that the feedback signal is fed back to the input port via a ~~the corresponding~~ resistive negative feedback circuit corresponding to a current gain mode.

25 12. (currently amended) The method of claim 8 wherein the plurality of resistive negative feedback circuits are respectively a resistor being electrically connected in series with ~~to~~ a capacitor.

13. (original) The method of claim 8 wherein the amplifier is a low-noise

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amplifier.

14. (withdrawn) A differential amplifier with substantially fixed input impedance when operating in a plurality of gain modes, the differential amplifier comprising:

- 5 a positive input port for receiving a positive input signal;
a negative input port for receiving a negative input signal;
a positive amplifier circuit electrically connected to the positive input port, the positive amplifier circuit comprising:
10 a positive gain circuit for amplifying a positive input signal by corresponding gain ratios; and
a plurality of positive resistive negative feedback circuits for keeping the input impedance of the positive amplifier circuit substantially fixed in various gain modes; and
a negative amplifier circuit electrically connected to the negative input port, the
15 negative amplifier circuit comprising:
a negative gain circuit for amplifying a negative input signal by corresponding gain ratios; and
a plurality of negative resistive negative feedback circuits for keeping the input impedance of the negative amplifier circuit substantially fixed in
20 various gain modes;
a positive output port electrically connected to the positive amplifier circuit for outputting the processed positive input signal; and
a negative output port electrically connected to the negative amplifier circuit for outputting the processed negative input signal.

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15. (withdrawn) The differential amplifier of claim 14 wherein the input impedance of the positive amplifier circuit is the same as the input impedance of the negative amplifier circuit, and the input impedance of the differential amplifier is a

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mathematical combination between the input impedance of the positive amplifier circuit and the input impedance of the negative amplifier circuit.

- 5 16. (withdrawn) The differential amplifier of claim 14 wherein in each gain mode, in the positive amplifier circuit, a positive feedback signal is fed back to the positive input port via at least a corresponding positive resistive negative feedback circuit, so that the input impedance of the positive amplifier circuit remains substantially fixed in various gain modes.
- 10 17. (withdrawn) The differential amplifier of claim 16 wherein the positive amplifier circuit further comprises at least a switch device electrically connected to at least a predetermined positive resistive negative feedback circuit for determining whether the positive feedback signal passes the predetermined positive resistive negative feedback circuit to the positive input port according to the various gain modes.
- 15 18. (withdrawn) The differential amplifier of claim 16 wherein in the positive amplifier circuit, the plurality of positive resistive negative feedback circuits are respectively a resistor electrically connected to a capacitor.
- 20 19. (withdrawn) The differential amplifier of claim 14 wherein in each gain mode, in the negative amplifier circuit, a negative feedback signal is fed back to the negative input port via at least a corresponding negative resistive negative feedback circuit, so that the input impedance of the negative amplifier circuit remains substantially fixed in various gain modes.
- 25 20. (withdrawn) The differential amplifier of claim 19 wherein the negative amplifier circuit further comprises at least a switch device electrically connected to

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at least a predetermined negative resistive negative feedback circuit for determining whether the negative feedback signal passes the predetermined negative resistive negative feedback circuit to the negative input port according to various gain modes.

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21. (withdrawn) The differential amplifier of claim 19 wherein in the negative amplifier circuit, the plurality of negative resistive negative feedback circuits are respectively a resistor electrically connected to a capacitor.

10 22. (withdrawn) The differential amplifier of claim 14 being a low-noise differential amplifier applied to a receiver of a wireless communication system.

15 23. (new) The amplifier of claim 3, wherein when the gain circuit is operating in a predetermined gain mode corresponding to a predetermined resistive negative feedback circuit having a switch, the switch is turned on to allow the feedback signal to feed back to the input port via the predetermined resistive negative feedback circuit; and when the gain circuit is operating in a gain mode other than the predetermined gain mode, the switch is turned off to prevent the feedback signal from passing through
20 the predetermined resistive negative feedback circuit.

24. (new) The amplifier of claim 1 being a differential amplifier with substantially fixed input impedance when operating in the plurality of gain modes, the amplifier further comprising:
25 a negative side input port for receiving a negative side of the input signal;
a plurality of negative side resistive negative feedback circuits electrically connected to the negative side input port and the gain circuit for keeping the input impedance of the amplifier substantially fixed in the various gain

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modes, each of the various gain modes having at least one corresponding negative side resistive negative feedback circuit; and
a negative side output port for outputting the negative side of the input signal amplified by the gain circuit.

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25.(new) The method of claim 10, further comprising:

when the gain circuit is operating in a predetermined gain mode corresponding to the predetermined resistive negative feedback circuit having the switch,
10 controlling the switch to turn on to allow the feedback signal to feed back to the input port via the predetermined resistive negative feedback circuit; and

when the gain circuit is operating in a gain mode other than the predetermined gain mode, controlling the switch to turn off to prevent the feedback signal from passing through the predetermined resistive negative feedback circuit.
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26. (new) The method of claim 8 being utilized in a differential amplifier for keeping the input impedance of the differential amplifier substantially fixed in each of the plurality of gain modes, the method further comprising:
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providing at least one negative side resistive negative feedback circuit for each of the various gain modes, each negative side resistive negative feedback circuit being electrically connected between a negative side of the input signal and the gain circuit.
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